

Can a side column collision finite element model improve electric vehicle battery development?

application in the development of new energy electric vehicle battery pack brackets holds significant promise for expediting the development cycle and reducing associated costs. Tang et al.⁶ validated the precision of the side column collision finite element model of the power battery system through vehicle side column collision testing.

How does a rigid column affect a battery pack box?

In the analysis of the vehicle side impact test, the rigid column invades the electric vehicle, which deforms the sill beam and the side of the battery pack box. Figure 10 shows the distribution of the stress nephogram of the battery pack box during the collision.

What happens if a power battery collides with a side column?

As displayed by their research findings, during side column collisions, both the outer frame and internal support structure of the power battery pack experienced striking deformation, while the battery system encountered substantial acceleration impacts across all positions.

Can a model-based methodology be used in the design of battery packs?

Conclusions This study developed a model-based methodology for use in the design of battery packs for automotive applications. This methodology is based on a multi-domain simulation approach to allow electric, thermal and geometric evaluations of different battery pack configurations, with particular reference to Li-NMC technology.

Can a multi-domain modelling methodology support the design of new battery packs?

This work proposes a multi-domain modelling methodology to support the design of new battery packs for automotive applications. The methodology allows electro-thermal evaluation of different spatial arrangements of the storage cells by exploiting the implementation of numerical and geometrical battery pack models.

How to improve battery pack performance for new energy electric vehicles?

Certainly, to strengthen the all-round performance of the battery pack system for new energy electric vehicles, further experiments are essential. These may include 3D printing of high-performance cooling water circuits for batteries, assessing the impact resistance of battery systems, and other relevant studies.

Zheng⁷ adopted finite element analysis software to conduct lightweight design optimization of a specific brand's new energy vehicle battery pack enclosure. It's noteworthy that their...

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Concerning the case study on ...

Columbia Engineering material scientists have been focused on developing new kinds of batteries to transform how we store renewable energy. In a new study recently published by Nature Communications, the team used K-Na/S batteries that combine inexpensive, readily-found elements -- potassium (K) and sodium (Na), together with sulfur (S) -- to ...

Key studies demonstrate the effectiveness of direct-cooled BTMS and optimized liquid-cooled plates in maintaining optimal battery temperatures and safety. Additionally, structural ...

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Lithium-ion batteries (LIBs) with relatively high energy density and power density are considered an important energy source for new energy vehicles (NEVs). However, LIBs are highly sensitive to temperature, which ...

The review shows that nano and graphene models, with their corresponding energy systems, significantly improve the performance of lithium batteries, thus supporting ...

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